

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTY.'S DOCKET: CHAO=11A

In re Application of:)	Art Unit: 1649
)	
CHAO et al.)	Examiner: O. N. Chernyshev
)	
Appln. No.: 10/021,571)	Washington, D.C.
)	
Date Filed: December 19, 2001)	Confirmation No. 9320
)	
For: TRANSMEMBRANE PROTEIN AS A)		
DOWNSTREAM TARGET OF...)	

DECLARATION UNDER 37 CFR §1.132

Honorable Commissioner for Patents
U.S. Patent and Trademark Office
Customer Service Window
Randolph Building, Mail Stop
401 Dulany Street
Alexandria, VA 22314

Sir:

I, Moses V. CHAO, hereby declare and state as follows:

I am the same Moses V. Chao listed as an inventor in the above-identified application and my educational and professional experience is presented in the curriculum vitae attached hereto.

I understand that the ARMS polypeptide of SEQ ID NO:2 or SEQ ID NO:4, as presently claimed, is rejected for lack of a specific and substantial utility because the examiner asserts that any protein which is expressed in

neuronal cells could be used for the same purpose with equal level of success. The examiner's assertion however is not correct. The presently claimed ARMS polypeptide is localized discretely (and specifically) at growth cones and in the synaptic regions of neurons so as to serve as a marker for visualizing the growth cone of neurons (see page 27 of the present specification), which is particularly important when neuroscientists need to determine whether or not neurons are alive and making contacts and synapses, such as after neuronal injury. While there are many cytoskeletal proteins, such as actin and tubulin, which are found in the growth cones, they are not only localized at the growth cones but are also located elsewhere as well. Accordingly, the presently claimed ARMS polypeptide is specific for growth cones and is not a general tissue marker for neurons where any protein expressed in neuronal cells could be used for the same purpose.

After conducting an extensive search of the literature and of commercially available tissue markers/antibodies, I have found only two other proteins, VAMP-2 and GAP-43, besides ARMS, that are growth cone-specific. Antibodies to VAMP-2 and GAP-43 are commercially available from Synaptic Systems and Sigma-Aldrich, respectively.

As very few of the proteins expressed in a neuronal cell are growth cone-specific and as there is a real need for growth cone-specific markers to determine whether or not neurons are alive and making contacts and synapses, the presently claimed ARMS polypeptide of SEQ ID NO:2 or SEQ ID NO:4 does indeed satisfy the utility requirements of 35 U.S.C. §101 by having a specific, substantial and credible utility. Moreover, one of ordinary skill in the art would fully recognize and be enabled for how to use the presently claimed ARMS polypeptide.

The undersigned declares further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.



July 2, 2008

Date

/Moses V. Chao/

Curriculum Vitae

Moses V. Chao

Address

Molecular Neurobiology Program
Skirball Institute of Biomolecular Medicine
Departments of Cell Biology, Physiology & Neuroscience and Psychiatry
New York University School of Medicine
540 First Avenue
New York, N.Y. 10016
212-263-0721 Fax 212-263-0723
chao@saturn.med.nyu.edu
<http://saturn.med.nyu.edu/research/mn/chaolab>

Education

B.A.	1970-1973	Pomona College, Claremont, California
Ph.D.	1975-1980	UCLA, Department of Chemistry, Los Angeles, CA Advisors: Jay Gralla and Harold Martinson
Postdoctoral fellow	1980-1983	Columbia University College of Physicians & Surgeons, Advisor: Richard Axel

Experience

1975-1978 Teaching Assistant, Department of Chemistry, UCLA
1976-1980 Predoctoral research, UCLA, Los Angeles, California
1980-1983 Postdoctoral research, Columbia University, New York, New York
1984-1989 Assistant Professor, Dept. of Cell Biology and Anatomy, Cornell
University Medical College, New York
1989-1991 Associate Professor, Cornell University Medical College
1991-1998 Professor of Cell Biology in Medicine, Cornell Medical College
1997-1998 Joseph C. Hinsey Professor of Cell Biology, Cornell Medical College
1998 - Professor of Cell Biology, Physiology and Neuroscience, Co-Coordinator,
Molecular Neurobiology Program, Skirball Institute of Biomolecular
Medicine, New York University School of Medicine

Honors

American Cancer Society Postdoctoral Fellowship, 1980-1983
Cornell University Scholars Award, 1985-1988
Hirschl/Caulier Faculty Award, 1987-1992
Zenith Award, Alzheimer's Association, 1991-1994
Presidential Symposium Speaker, Society of Neuroscience Annual Meeting, 1993
Guggenheim Fellowship, 1994
John Flynn Lecturer, Yale University, 1995
Randall Lecturer in Pharmacology, University of Pennsylvania, 1995
Javits Neuroscience Investigator Award, 1996-2003
UCLA Tenth Annual Neuroscience Distinguished Speaker, 1998
Great Lakes Glia Meeting, Keynote Speaker, 1999
Helen Wilshire Walsh Lecturer, 2000
Grass Foundation Lecturer, 2000
Berlin Neuroscience Forum Lecturer, 2002
Weizmann Institute Life Science Lecturer, 2003
Cajal Institute Lecturer, 2004
World Congress on Psychiatric Genetics Plenary Speaker, 2007

Fellow, AAAS

Professional Duties

Editorial Board

1991- 1996	<i>Neuron</i>
1991 -	<i>Journal of Cellular Biochemistry</i>
1992 - 1997	<i>Journal of Biological Chemistry</i>
1993 -	<i>International Journal of Developmental Neuroscience</i>
1994 - 2006	<i>Molecular and Cellular Neuroscience</i>
1995 -	<i>Cytokine and Growth Factor Research</i>
1995 -	Editor, <i>Journal of Neurobiology</i>
1996 - 2002	Section Editor, <i>Journal of Neuroscience</i>
2002 - 2006	Associate Editor, <i>Experimental Neurology</i>
2002 - 2006	Associate Editor, <i>Molecular and Cellular Neuroscience</i>
2006 -	Senior Editor, <i>Journal of Neuroscience</i>

Advisory Panels & Study Sections

1988 - 1993	American Cancer Society Personnel Study Section
1988 - 1993	Regeneron Scientific Advisory Board
1989 - 1996	Alzheimer's Association Medical and Scientific Advisory Board
1992 - 1996	NIH Neuroscience Training (NST) Study Section
1991 - 1999	American Paralysis Association Scientific Advisory Board
1994 - 1996	Trophix Scientific Advisory Board
1996 - 1998	NICHD Intramural Review Panel
1997	NLS-3 Special Emphasis Panel
1997	NIH Neuroscience Working Group
1998	Diabetic Neuropathy Study Section
1998	NSF Developmental Neuroscience Study Section
1999 -	Christopher Reeve Paralysis Foundation Scientific Advisory Board
2000 -	NICHD Board of Scientific Counselors
2000 - 2003	Program Committee, Society of Neuroscience (Chair, 2002)
2001 - 2004	Kirsch Foundation Scientific Advisory Board
2001	NICHD Laboratory of Mammalian Genes and Development Review Panel
2001 - 2005	Chair, New York State Spinal Cord Injury Research Board (SCIRB)
2002	NIA Special Emphasis Panel
2002	NINDS Board of Scientific Counselors Intramural Review Panel
2002	Center for Scientific Review Special Emphasis Panel ZRG FO3A
2003	Wadsworth Foundation Strategic Scientific Advisory Board
2003 - 2006	National Multiple Sclerosis Society Study Section
2004 -	NIH MCDN-2 (NDBG) Study Section Member
2004 -	Chair, Glaucoma Foundation Scientific Advisory Board
2005 - 2006	Chair, NICHD Board of Scientific Counselors
2005 -	Chair, Christopher and Dana Reeve Foundation Scientific Advisory Board
2005 -	Scientific Advisory Board, MIND Center, University of Aarhus, Denmark
2006 -	NIH Neuroscience Blueprint Committee
2006 -	Secretary, Society of Neuroscience
2007 -	NIMH Genes, Cognition and Psychosis (GCAP) Scientific Advisory Board
2007 -	Simons Foundation Scientific Advisory Panel
2007	Hi Q Foundation Workshop on BDNF and Huntington's Disease
2007	Christopher and Dana Reeve Foundation Workshop on Stem Cells

Meeting Organizer

Keystone UCLA Symposium, *Molecular Biology of Neuronal Signal Transduction*
Co-Organizer with Tom Curran, Jim Morgan, and Tom Schwarz
Taos, New Mexico, April 1993
International Society of Neurochemistry, Symposium Chairman, *Neurotrophins*,
Montpellier, France, August, 1993
International Society of Neurochemistry, Program Committee, Kyoto, 1995.
Gordon Conference, *Neurotrophins*, Vice-Chair, Plymouth, New Hampshire, 1993.
Gordon Conference, *Neurotrophins*, Co-Chair, 1995
Society of Neuroscience Symposium Chair, *Molecular Mechanisms of Cell Death*, Miami, 1999
Chair, Society of Neuroscience Program Committee, 2002
Novartis Foundation, *Growth Factors and Psychiatric Disorders*, Chair, London, 2007
New York State Spinal Cord Research Board Symposium, New York Academy of Sciences,
New York, 2008
NGF2008 Katzir Conference on Life and Death in the Nervous System, Galilee, Israel,
September, 2008

Teaching Responsibilities

Molecular Genetics graduate course, Cornell University Graduate School, 1984-1996
Microscopic Anatomy, Cornell University Medical College, 1985-1997
Course Director, 1989-1991
Advanced Cell Biology, Cornell University Graduate School, 1992-1994
MD/PhD Frontiers Course, Tri-Institutional Cornell/Rockefeller/Sloan Kettering MD/PhD
Program, 1991-1996
Short Course in Molecular Biology, Society for Neuroscience Annual Meeting, 1991
Molecular Neurobiology Course, University of Buenos Aires, 1998
Integrative, Developmental and Cognitive Neuroscience Course, NYU Sackler Institute, 1998-
2005
Developmental Neurobiology, NYU Center for Neuroscience, 2002-2005
Cell Biology, NYU School of Medicine, 2001-2005
Synaptic Transmission, NYU Neuroscience Graduate course, 2003
Molecular Oncology, NYU Graduate course, 2005-6
Cellular Neuroscience, NYU Graduate course, 2007
Cold Spring Harbor Laboratory, *Molecular Cloning of Neural Genes*, Instructor, 1990-1995
Cold Spring Harbor Summer Courses
Invited Lecturer in *Advanced Cloning*, 1988
Invited Lecturer, *Molecular Probes*, 1989
Invited Lecturer, *Neuronal Development*, 1993
Invited Lecturer, *Neurodegenerative Disease*, 1997
Woods Hole Marine Laboratory, *Neuroimmunology*, Lecturer, 2001, 2003, 2005, 2007

Ad Hoc Reviewer

Welcome Trust Foundation; Israel Science Foundation; Alberta Heritage Foundation
National Science Foundation; Human Frontier Science Program; Hong Kong Research Grants
Council; Department of Veteran's Affairs; Medical Research Council

Nature, Science, Proceedings of the National Academy of Sciences, Cell, Journal of Neuroscience, Journal of Cell Biology, Journal of Neurobiology, Journal of Clinical Investigation, Journal of Biological Chemistry, EMBO Journal, Development, Neuron

Previous Trainees

<i>Name</i>	<i>Current Position</i>
Amita Sehgal, PhD	Professor, HHMI, University of Pennsylvania
C. Randy Buck, PhD	Research Associate, Emory University
Barbara Hempstead, MD/PhD	Professor, Weill Medical College, Cornell University
Nila Patil, PhD	Scientist, Perlegen
Enrique Escandon, PhD	Scientist, Genentech
Kathy Hsu, MD/PhD	Fellow, Sloan Kettering Institute
Hai Yan, PhD	Scientist, Amgen
David Battleman, MD	Resident, New York Hospital
Marta Benedetti, PhD	Research Programs, Simons Foundation
Prakash Rao, PhD	Postdoctoral fellow, M.I.T.
Curt Horvath, PhD	Associate Professor, Northwestern University
Margaret Berg, PhD	Postdoctoral fellow, University of Illinois
Julie Huber, PhD	Scientist, Elixir Pharmaceuticals, Cambridge MA
Margret Einarson, PhD	Postdoctoral fellow, Fox Chase Cancer Institute
Mona Friedin, PhD	Research Associate, Albert Einstein College of Medicine
Alex Castellino, PhD	Medical publishing
Sung Ok Yoon, PhD	Associate Professor, Ohio State University
Bruce Carter, PhD	Associate Professor, Vanderbilt University
Alexandra Chittka, PhD	Research Fellow, University College London
Jason Orlinick, MD/PhD	Fellow, Brigham & Women's Hospital
Donna Osterhout, PhD	Assistant Professor, SUNY Upstate Medical University
Gus Khurigara, PhD	Biotechnology analyst
Patrizia Casaccia-Bonnel, MD/PhD	Associate Professor, Robert Wood Johnson Medical School
Ravi Tikoo, MD	Assistant Professor, NYU School of Medicine
Francis S. Lee, MD/PhD	Assistant Professor, Weill Medical College, Cornell University
Albert Kim, MD/PhD	Fellow, Brigham & Women's Hospital
Mi-Sook Chang, PhD	Assistant Professor, Seoul National University
JoAnn Gensert, PhD	Research Associate, Burke Rehabilitation Center
Simon Murray, PhD	Senior Research Officer, University of Melbourne
Gregg Caporaso, MD/PhD	Assistant Professor, Weill Medical College, Cornell University
Hiroko Yano, PhD	Research Associate, Brigham and Women's Hospital
Daniela Pereira, PhD	Research Associate, Columbia University
Yuriko Iwakura, PhD	Research Associate, Niigata University
Katerina Akassoglou, PhD	Assistant Professor, UCSD
Niccolo Zampieri, PhD	Postdoctoral Fellow, Columbia University
Chenghua Gu, PhD	Assistant Professor, Harvard Medical School
Juan Carlos Arevalo, PhD	Assistant Professor, University of Salamanca
Marco Domeniconi, PhD	Research Assistant Professor, Hunter College

Current Lab Personnel

Vladimir Camarena, graduate student
 Katrin Deinhardt, PhD
 Freddy Jeanneteau, PhD
 Rithwick Rajagopal, MD/PhD student
 Pamela Roehm, MD/PhD

Stephen Russell, MD
Jhon Sutachan-Rubio, graduate student
Synphen Wu, MD/PhD student
Ipe Ninan, PhD

Major Speaker Invitations (Since 1998)

5th International NGF Meeting, Stockholm 1998
Gordon Conference, *Polypeptide Growth Factors*, 1998
Joint Meeting--Japan Neuroscience Society and Japanese Society for Neurochemistry, Tokyo, 1998
COE Symposium on Plasticity and Regeneration, Tokyo, 1998
UCLA Tenth Annual Neuroscience Poster Session Distinguished Speaker, 1998
Columbia University Center for Neurobiology & Behavior, 1999
National Multiple Sclerosis Society, *Neurotrophins and Multiple Sclerosis*, New York City, 1999
International Society of Psychoneuroendocrinology, Orlando, 1999
Symposium on *Apoptosis in neuronal systems*, Regensburg, 1999
12th Camerino-Noordwijkerhout Symposium, Camerino, Italy, 1999
Great Lakes Glia Meeting Keynote Speaker, 1999
New York Academy of Sciences Neuroscience Section Speaker, 1999
SmithKline Beecham Neuroscience Seminar Speaker, 1999
Ohio State University Grass Traveling Scientist, 2000
Miami Project to Cure Paralysis Visiting Professor Lecture, 2000
13th Biennial ISDN Meeting, Heidelberg, Germany, 2000
University of Ottawa Neuroscience Research Institute, 2000
6th International Conference on *NGF and Related Molecules*, Montreal, 2000
Vanderbilt University School of Medicine, 2000
Children's Hospital, Harvard Medical School, 2000
Elan Pharmaceuticals, 2001
University of Tennessee College of Medicine, 2001
University of Oregon Health Sciences Center, 2001
Columbia University College of Physicians and Surgeons, 2001
Beth Israel Hospital, Harvard Medical School, 2001
Research to Prevent Blindness: *Glaucoma: A novel neuronal degeneration*, Sarasota, 2001
University of Rochester School of Medicine, 2002
Johns Hopkins University School of Medicine, 2002
Australian Neuroscience Meeting, Sydney, 2002
University of Massachusetts School of Medicine, 2002
American Society of Neurochemistry, Palm Beach, Florida, 2002
International Workshop, *Repair of the Central Nervous System*, Nice, 2002
7th International Conference on *NGF and related Molecules*, Modena, 2002
Gordon Conference, *Molecular and Cellular Neurobiology*, Hong Kong, 2002
University of Maryland School of Medicine, 2002
University of Coimbra Center for Neuroscience, Portugal, 2003
UK Glial Cell Club, London, 2003
Pasteur Institute, January 2003
University of Iowa School of Medicine, March 2003
University of Alabama School of Medicine, September 2003
Weizmann Institute, Rehovot, 2003
Hebrew University, Jerusalem, 2003
Tel Aviv University, Tel Aviv, 2003
University of Pittsburgh School of Medicine, January 2004
State University of New York, Stony Brook, 2004
Cancer UK, London, 2004

NINDS Seminar Speaker, March 2004
 University of North Carolina School of Medicine, 2004
 Juan March Symposium, Madrid, April 2004
 Buck Institute for Aging Research, 2004
 Institute for the Study of Aging Workshop, New York, 2004
Mechanisms of Protein Activation, Wurzburg, 2004
 Wyeth Research, *Restoring Function to the Damaged Brain*, Perugia, 2004
Neuroplasticity, Neurotrophic Factors and Affective Disorders, Pisa, 2005
 Mt Sinai Hospital, Toronto, June 2005
 Gordon Conference, Neurotrophins, Newport RI, 2005
International Symposium on Aging and Neurodegeneration, Seoul, 2005
 Tong Joh Honorary Symposium, Burke Medical Institute, November, 2005
 Novartis Foundation, *Purinergic Signalling in Neuron-Glia Interactions*, London, 2005
 King's College, London, January 2006
 Columbia University Center for Neurobiology, January 2006
 Cleveland Clinic, February 2006
 University of Louisville, 2006
 Johns Hopkins School of Medicine, March 2006
 University of Louisville School of Medicine, March 2006
 UCSD School of Medicine, March 2006
 Rockefeller University Seminars in Clinical Research, April 2006
Neurotrophins: Mechanisms in Disease and Therapy, Bristol UK, April, 2006
 NGF 2006 Meeting, Lyon, France, May, 2006
Molecular and Cellular Basis of Neuroconnectivity, Leuven, Belgium, May, 2006
 Mt. Sinai School of Medicine, June 2006
 Society of Neuroscience Symposium on Stem Cells, October 2006
 Adler Foundation *Symposium on Alzheimer's Disease*, Salk Institute, February, 2007
 Emory University School of Medicine, May 2007
 USC School of Medicine, September 2007
 World Congress on Psychiatric Genetics, Plenary Speaker, New York City, October 2007
 Columbia University Motor Neuron Center, January 2008
 Keynote Speaker, Dartmouth University Annual Neuroscience Day, February 2008
 Invited Lecturer, Pasteur Institut, April 2008
 Duke University School of Medicine, May 2008

Membership

Society of Neuroscience
 American Society of Cell Biology
 Harvey Society

Patents

US Patent No. 7,169,568 on January 30, 2007

Method for screening molecules that exert a neurotrophic effect through activation of neurotrophin receptors

Bibliography

- Chao, M.V., Gralla, J.D. and Martinson, H.G. (1979) DNA sequence directs the placement of histone cores on restriction fragments. *Biochemistry* 18, 1068-1074.
- Chao, M.V., Martinson, H.G and Gralla, J.D. (1980) Lac operator nucleosomes. I. Repressor binds specifically to operator within the nucleosome core. *Biochemistry* 19, 3254-3260.
- Chao, M.V., Gralla, J.D. and Martinson, H.G. (1980) Lac operator nucleosomes. II. Lac nucleosomes can change conformation to strengthen binding by lac repressor. *Biochemistry* 19, 3260-3269.
- McKnight, S.L., Chao, M.V., Sweet, R.W., Silverstein, S. and Axel, R. (1981) Transcriptional control of transformed genes. *Oncodev. Biol. and Medicine* 4, 81-95.
- McKnight, S.L., Chao, M.V., Sweet, R.W., Silverstein, S. and Axel, R. (1981) The structure and function of a eukaryotic promoter. In: Primary and Tertiary Structure of Nucleic Acids and Cancer Research (M. Miwa, S. Nishimura, A. Rich, D. Soll, and T. Sugimura, Editors) Japan Sci. Soc. Press, Tokyo, pp. 73-85.
- Sweet, R.W., Chao, M.V. and Axel, R. (1982) The structure of the tk gene promoter: Nuclease hypersensitivity correlates with expression. *Cell* 31, 347-353 (1982).
- Chao, M.V., Mellon, P., Wold, B., Maniatis, T. and Axel, R. (1982) The structure and function of a eukaryotic promoter. In: Tumor Cell Heterogeneity: Origins and Implications (A.H. Owens, D.S. Coffey, and S.B. Baylin, Editors) Academic Press, New York, pp. 425-440.
- Chao, M.V., Mellon, P., Charney, P., Maniatis, T. and Axel, R. (1983) The regulated expression of globin genes in mouse erythroleukemia cells. *Cell* 32, 483-493.
- Chao, M.V., Mellon, P., Charney, P., Maniatis, T. and Axel, R. (1983) Introduction and expression of beta-globin genes in murine erythroleukemic cells. *Gene Amplification Anal.* 3, 215-231.
- Charney, P., Treisman, R., Mellon, P., Chao, M., Axel, R. and Maniatis (1984) Differences in the expression of cloned human α - and β -globin genes introduced into mouse erythroleukemia cells. *Cell* 38, 251-263.
- Chao, M.V., Mellon, P., Wold, B., Maniatis, T. and Axel, R. (1984) Regulation of globin genes introduced into murine erythroleukemia cells. In: Cell Fusion: Gene Transfer and Transformation, volume 14 (R. Beers and W. Bassett, Editors) Raven Press, New York, pp. 89-100.
- Mill, J.F., Chao, M.V. and Ishii, D.N. (1985) Insulin, insulin-like growth factor II, and nerve growth factor effects on tubulin mRNA synthesis and neurite formation. *Proc Natl Acad. Sci USA* 82, 7126-7130.
- Chao, M.V., Bothwell, M.A., Ross, A.H., Koprowski, H., Lanahan, A.A., Buck, C.R. and Sehgal, A. (1986)

Gene transfer and molecular cloning of the human NGF receptor. *Science* 232, 518-521.

- Johnson, D., Lanahan, A., Buck, C.R., Sehgal, A., Morgan, C., Mercer, E., Bothwell, M. and Chao, M. (1986) Expression and structure of the human NGF receptor. *Cell* 47, 545-554.
- Huebner, K., Isobe, M., Chao, M. Bothwell, M. Ross, A.H., Finan, J., Hoxie, J.A., Sehgal, A., Buck, C.R., Lanahan, A., Nowell, P.C., Koprowski, H. and Croce, C.M. (1986) The nerve growth factor receptor gene is at human chromosome region 17q12-17q22, distal to the chromosome 17 breakpoint in acute leukemias. *Proc Natl Acad Sci USA* 83, 1403-1407.
- Breakefield, X.O., Ozelius, L., Bothwell, M.A., Chao, M.V., Axelrod, F., Kramer, P. L., Lanahan, A., Johnson, D.E., Ross, A.H. and Gusella, J.F. (1986) DNA polymorphisms for the nerve growth factor receptor gene exclude its role in familial dysautonomia. *Molecular Biol. and Medicine* 3, 483-494.
- Chao, M.V. (1986) Expression of transfected genes. In: Gene Transfer (R. Kucherlapati, editor) Plenum Press, New York, pp. 223-241.
- Buck, C.R., Martinez, H., Black, I.B. and Chao, M.V. (1987) Developmentally regulated expression of the NGF receptor gene in the periphery and brain. *Proc. Natl. Acad. Sci. USA* 84, 3060-3063.
- Ross, A.H., Meryln, M., Maul, G.G., Koprowski, H., Bothwell, M., Chao, M., Pleasure, D. and Sonnenfeld, K.H. (1986) The nerve growth factor receptor in normal and transformed neural crest cells. In: Neurofibromatosis, Ann. New York Academy of Sciences, pp. 115-123.
- Seizinger, B., Rouleau, G.A., Ozelius, L.J., Lane, A.H., Farnyniarz, A.G., Chao, M.V., Huson, S., Korf, B.R., Parry, D.M., Pericak-Vance, M.A., Collins, F.S., Hobbs, W.J., Falcone, B.G., Iannazzi, J.A., Roy, J.C., St. George-Hyslop, P.H., Tanzi, R.E., Bothwell, M.A., Upadhyaya, M., Harper, P., Goldstein, A.E., Hoover, D.L., Bader, J.L., Spence, M.A., Mulvihill, J.J., Aylsworth, A.S., Vance, A.S., Rossenwasser, G.O.D., Gaskell, P.C., Roses, A.D., Martuza, R.L., Breakefield, X.O. and Gusella, J.F. (1987) Genetic linkage of von Recklinghausen neurofibromatosis to the nerve growth factor receptor gene. *Cell* 49, 589-594.
- Littman, D.R. and Chao, M.V. (1987) Use of gene transfer in the isolation of cell surface receptor genes. In: Genetic Engineering, volume 9 (Jane Setlow, Editor), pp. 89-105.
- Lemke, G. and Chao, M. (1988) Axons regulate Schwann cell expression of major myelin and NGF receptor genes. *Development* 102, 499-504.
- Hotta, H., Ross, A.H., Heubner, K. Isobe, M., Chao, M.V. Ricciardi, R.P., Tsujimoto, Y., Croce, C.M. and Koprowski, H. (1988) Molecular cloning and characterization of a melanoma-associated antigen (ME491) expressed at the early stages of tumor progression. *Cancer Res* 48, 2955-2962.
- Chao, M.V. (1988) Gene transfer and expression of mammalian cell receptors. In: Endocrine Genes: Analytical methods, experimental approaches, and selected systems (Y-F. Lau, Editor) Oxford University Press, New York, pp. 3-18.
- Sehgal, A., Patil, N. and Chao, M. (1988) A constitutive promoter directs expression of the nerve growth factor receptor gene. *Mol Cell Biol* 8, 3160-3167.
- Peacocke, M., Yaar, M., Mansur, C.P., Chao, M.V. and Gilchrist, B.A. (1988) Induction of nerve growth factor receptors on cultured human melanocytes. *Proc Natl. Acad Sci. USA* 85, 5282-5286.
- Sehgal, A., Wall, D. and Chao, M. (1988) Efficient processing and expression of human NGF receptors in

Xenopus oocytes: Effects on maturation. *Mol. Cell Biol* 8, 2242-2246.

- Hempstead, B.L., Patil, N., Olson, K. and Chao, M.V. (1988) Molecular analysis of the nerve growth factor receptor. *Cold Spring Harbor Symposium* 53, 477-486.
- Buck, C.R., Martinez, H., Chao, M.V. and Black, I.B. (1988) Differential expression of the nerve growth factor receptor gene in multiple brain areas. *Dev Brain Res* 44, 259-268.
- Wright, E.C., Fain, P.R., Barker, D.F. and Chao, M.V. (1989) A moderately frequent HindIII polymorphism at the human NGFR locus (17q12-17q22). *Nucleic Acids Res.* 5, 825.
- Hempstead, B.L., Schleifer, L.S. and Chao, M.V. (1989) Expression of functional NGF receptors after gene transfer. *Science* 243, 373-375.
- Goedert, M, Fine, A., Dawbarn, D., Wilcock, G.K. and Chao, M.V. (1989) Nerve growth factor receptor mRNA distribution in human brain: normal levels in basal forebrain in Alzheimer's disease. *Mol Brain Res* 5, 1-7.
- Chan, B.L., Chao, M.V., Saltiel, A.R. (1989) Nerve growth factor stimulates the hydrolysis of glycosylphosphatidylinositol in PC12 cells: A novel mechanism of protein kinase C regulation. *Proc Natl Acad Sci USA* 86, 1756-1760.
- Hempstead, B.L. and Chao, M.V. (1989) The nerve growth factor receptor: Biochemical and structural analysis. *Rec Prog Hormone Res* 45, 441-466.
- Escandon, E. and Chao, M.V. (1989) Developmental expression of the chicken nerve growth factor receptor gene during brain morphogenesis. *Devl. Brain Res* 47, 187-196.
- Sehgal, A., Bothwell, M. and Chao, M.V. (1989) Gene transfer of truncated NGF receptor clones leads to cell surface expression in mouse fibroblasts. *Nucl Acids Res* 17, 5623-5632.
- Gibbs, R.B., McCabe, J.T., Buck, C.R., Chao, M.V. and Pfaff, D.W. (1989) Expression of NGF receptor in the rat forebrain detected with *in situ* hybridization and immunohistochemistry. *Mol Brain Res* 6, 275-287.
- Miyasaka, T., Chao, M.V., Sherline, P. and Saltiel, A.R. (1990) Nerve growth factor stimulates a protein kinase in PC12 cells that phosphorylates microtubule associated protein-2. *J Biol Chem* 265, 4730-4735.
- Hempstead, B.L., Patil, N., Thiel, B. and Chao, M.V. (1990) Deletion of cytoplasmic sequences of the NGF receptor leads to a loss of high affinity ligand binding. *J Biol Chem* 265, 9595-9598.
- Patil, N., Lacy, E. and Chao, M.V. (1990) Specific neuronal expression of human NGF receptors in the basal forebrain and cerebellum of transgenic mice. *Neuron* 4, 437-447.
- Escandon, E. and Chao, M.V. (1990) Identification of high and low affinity NGF receptors during development of the chicken central nervous system. *Dev Biol* 142, 293-300.
- Chao, M.V. (1990) Nerve growth factor. In: Peptide Growth Factors and their Receptors (M. Sporn and A. Roberts, Editors). Handbook of Experimental Pharmacology, vol. 95, Springer-Verlag, Berlin, pp. 135-165.
- Patil, N., Lacy, E. and Chao, M.V. (1990) Human NGF receptor expression in the CNS of transgenic mice. In: Growth Factors and Alzheimer's Disease (Y. Christen, Editor), Springer-Verlag, Berlin, pp. 62-72.

- Clagett-Dame, M., Chung, C., Chao, M.V. and DiStefano, P.S. (1990) Monoclonal antibodies to the cell surface and a soluble form of the human nerve growth factor receptor. *J Neurosci Res* 27, 642-650.
- Gibbs, R.B., Chao, M.V. and Pfaff, D.W. (1991) Effects of fimbria-fornix and angular bundle transection on expression of p75^{NGFR} mRNA by cells in the medial septum and diagonal band of Broca: correlations with cell survival, synaptic reorganization and sprouting. *Mol Brain Res* 11, 207-219.
- Berg, M.M., Sternberg, D., Hempstead, B. and Chao, M.V. (1991) The low affinity p75 NGF receptor mediates NGF-induced tyrosine phosphorylation. *Proc Natl Acad Sci USA* 88, 7106-7110.
- Kaplan, D.R., Hempstead, B.L., Martin-Zanca, D., Chao, M.V. and Parada, L.F. (1991) The *trk* proto-oncogene product: a signal transducing receptor for nerve growth factor. *Science* 252, 554-558.
- Hempstead, B.L., Martin-Zanca, D., Kaplan, D.R., Parada, L.F. and Chao, M.V. (1991) High affinity binding requires co-expression of the *trk* proto-oncogene and the low affinity NGF receptor. *Nature* 350, 678-683.
- Yan, H., Schlessinger, J. and Chao, M.V. (1991) Chimeric NGF and EGF receptors define domains responsible for neuronal differentiation. *Science* 252, 561-563.
- Loeb, D.M., Maragos, J., Martin-Zanca, D., Chao, M.V., Parada, L.F. and Greene, L.A. (1991) The *trk* proto-oncogene rescues NGF responsiveness in mutant NGF-nonresponsive PC12 cell lines. *Cell* 66, 961-966.
- Yan, H. and Chao, M.V. (1991) Disruption of cysteine rich repeats of the NGF receptor leads to loss of ligand binding. *J Biol Chem* 266, 12099-12104.
- LeBivic, A., Sambuy, Y., Patzak, A., Patil, N., Chao, M. and Rodriguez-Boulant, E. (1991) An internal deletion in the cytoplasmic tail reverses the apical localization of human NGF receptor in transfected MDCK cells. *J Cell Biology* 115, 607-618.
- Chao, M.V. (1992) Growth factor signaling: Where is the specificity? *Cell* 68, 995-997.
- Berg, M.M., Sternberg, D., Parada, L.F. and Chao, M.V. (1992) K-252a inhibits NGF-induced *trk* proto-oncogene tyrosine phosphorylation and kinase activity. *J Biol Chem* 267, 13-16.
- Chao, M.V., Battleman, D.S. and Benedetti, M. (1992) Receptors for nerve growth factor. *Int Rev Cytology* 137, 169-180.
- Lee, K-F., Li, E., Huber, L.J., Landis, S.C., Sharpe, A.H., Chao, M.V. and Jaenisch, R. (1992) Targeted mutation of the gene encoding the low affinity NGF receptor p75 leads to deficits in the peripheral sensory nervous system. *Cell* 69, 737-749.
- Chao, M.V. (1992) Neurotrophin receptors: A window into neuronal differentiation. *Neuron* 9, 583-593.
- Battleman, D.S., Geller, A.I. and Chao, M.V. (1993) HSV-1 vector mediated gene transfer of the human NGF receptor p75^{hNGFR} defines high affinity NGF binding. *J Neurosci* 13, 941-951.
- Hsu, K.C. and Chao, M.V. (1993) Differential expression and ligand binding properties of tumor necrosis factor receptor chimera mutants. *J Biol Chem* 268, 16430-16436.
- Huber, L.J. and Chao, M.V. (1993) Transgenic expression of neurotrophic factors and their receptors. In *Neuromethods*, Vol. 25, Neurotrophic Factors (A. Boulton, G. Baker, F. Hefti, Editors) The Humana Press, pp. 231-245.

- Horvath, C.M., Wolven, A., Machado, D., Huber, L.J., Benedetti, M., Hempstead, B.L. and Chao, M.V. (1993) Analysis of the *trk* NGF receptor tyrosine kinase using recombinant fusion proteins. *J Cell Science* 17, 223-228.
- Benedetti, M., Levi, A. and Chao, M.V. (1993) Differential expression of nerve growth factor receptors leads to altered binding affinity and neurotrophin responsiveness. *Proc Natl Acad. Sci USA* 90, 7859-7863.
- Donovan, M.J., Hempstead, B.L., Horvath, C., Chao, M.V. and Schofield, D. (1993) Immunohistochemical localization of *trk* receptor protein in pediatric small round blue cell tumors. *Am J Pathology* 143, 1560-1567.
- Mahadeo, D., Kaplan, L., Chao, M.V. and Hempstead, B.L. (1994) High affinity NGF binding displays a faster rate of association than p140^{trk} binding: Implications for multi-subunit polypeptide receptors. *J Biol Chem* 269, 6884-6990.
- Chao, M.V. (1994) The p75 neurotrophin receptor. *J Neurobiology* 25, 1371-1385.
- Verdi, J., Birren, S., Ibanez, C., Persson, H., Kaplan, D.R., Benedetti, M., Chao, M.V. and Anderson, D. (1994) p75^{LNGFR} regulates Trk signal transduction and NGF-induced neuronal differentiation in MAH cells. *Neuron* 12, 733-745.
- Dobrowsky, R.T., Werner, M., Castellino, A.M., Chao, M.V. and Hannun, Y.A. (1994) Activation of the sphingomyelin cycle by the low affinity neurotrophin receptor. *Science* 265, 1596-1599.
- Donovan, M.J., Hempstead, B., Huber, L.J., Kaplan, D., Tsoulfas, P., Chao, M., Parada, L. and Schofield, D. (1994) Identification of the neurotrophin receptors p75 and *trk* in a series of Wilms' tumors. *Am. J Pathology* 145, 792-801.
- Samtambrogio, L., Benedetti, M., Chao, M.V., Muzaffar, R., Kulig, K., Gabellini, N. and Hochwald, G. (1994) Nerve growth factor production by lymphocytes. *J Immunology* 152, 4488-4489.
- Huber, L.J. and Chao, M.V. (1995) Mesenchymal and neuronal cell expression of the p75 neurotrophin receptor are distinguished during morphogenesis of transgenic animals. *Developmental Biology* 167, 227-238.
- Van Zee, K.J., Stackpole, S.A., Montegut, W.J., Rogy, M.A., Calvano, S.E., Hsu, K.C., Chao, M., Meschter, C.L., Loetscher, H., Stuber, D., Ettlin, R., Wipf, B., Lesslauer, W., Lowry, S.F. and Moldawer, L.L. (1994) A human tumor necrosis factor (TNF) α mutant that binds exclusively to the p55 TNF receptor produces toxicity in the baboon. *J Exp Med* 179, 1185-1191.
- Chao, M.V. and Hempstead, B.L. (1995) Trk and p75: A two receptor system. *Trends Neurosci* 18, 321-326.
- Curtis, R., Adryan, K.M., Stark, J.L., Park, J.S., Compton, D.L., Weskamp, G., Huber, L.J., Chao, M.V., Jaenisch, R., Lee, K.F., Lindsay, R.M. and DiStefano, P.S. (1995) Differential role of the low affinity neurotrophin receptor (p75) in retrograde axonal transport of the neurotrophins. *Neuron* 14, 1201-1211.
- Rao, P., Hsu, K.C. and Chao, M.V. (1995) Upregulation of NF κ B dependent gene expression mediated by the p75 tumor necrosis factor receptor. *Lymphokine and Cytokine Res* 15, 171-177.
- Muragaki, Y., Timothy, N., Leight, S., Hempstead, B., Chao, M., Trojanowski, J. and Lee, V. (1995)

- Expression of Trk receptors in the developing and adult human central and peripheral nervous system. *J Comp Neurol* 356, 387-397.
- Huber, L.J. and Chao, M.V. (1995) A potential interaction of p75 and trkA NGF receptors revealed by affinity crosslinking and immunoprecipitation. *J Neurosci Res* 40, 557-563.
- Chao, M.V. (1995) Ceramide: A potential second messenger in the nervous system. *Mol Cell Neurosci* 6, 91-96.
- Monlauzeur, L., Rajasekaran, A., Chao, M., Rodriguez-Boulant, E. and LeBivic, A. (1995) A cytoplasmic tyrosine is essential for the basolateral localization of mutants of the human nerve growth factor receptor in Madin-Darby Canine kidney cells. *J Biol Chem* 270, 12219-12225.
- McDonald, N. and Chao, M.V. (1995) Structural determinants of neurotrophin action. *J Biol. Chem* 270, 19669-19672.
- Einarson, M. and Chao, M.V. (1995) Regulation of Id1 and its association with basic helix-loop-helix proteins during NGF-induced differentiation of PC12 cells. *Mol Cell Biol* 15, 4175-4183.
- Perez, P., Coll, P.M., Hempstead, B.L., Martin-Zanca, D. and Chao, M.V. (1995) NGF binding to the trk tyrosine kinase receptor requires the extracellular immunoglobulin-like domains. *Mol Cell Neurosci* 6, 97-105.
- Casaccia-Bonnet, P., Carter, B., Dobrowsky, R. and Chao, M.V. (1996) Death of oligodendrocytes mediated by an interaction of nerve growth factor and its receptor p75. *Nature* 383, 716-718.
- Chao, M.V. and Huber, L.J. (1996) Interactions between NGF receptors, TrkA and p75. In Life and death in the nervous system. Elsevier, Oxford, England.
- Orlinick, J. and Chao, M.V. (1996) Interactions of cellular polypeptides with the cytoplasmic domain of the mouse Fas antigen. *J Biol Chem* 271, 8627-8632.
- Yoon, S.O., Lois, C., Alvarez-Buylla, A., Falck-Pederson, E. and Chao, M.V. (1996) Adenovirus-mediated gene delivery into neuronal precursors in the adult mammalian brain. *Proc Natl Acad Sci USA* 93, 11974-11979.
- Castellino, A.M. and Chao, M.V. (1996) Trans-signaling by cytokine and growth factor receptors. *Cytokine & Growth Factor Reviews* 7, 297-302.
- Casaccia-Bonnet, P., Aibel, L. and Chao, M.V. (1996) Central glial and neuronal populations display differential sensitivity to ceramide-dependent cell death. *J Neurosci Res* 43, 382-389.
- Papandreou, C., Bogenrieder, T., Loganzo, F., Chao, M.V., Nanus, D.M. and Albino, A.P. (1996) Mutation and expression of the low affinity neurotrophin receptor in human malignant melanoma. *Melanoma Res* 6, 373-378.
- Tikoo, R., Casaccia-Bonnet, P., Chao, M. and Koff, A. (1997) Changes in CDK2 and p27^{Kip} during differentiation of CG-4 cells. *J Biol Chem* 272, 442-447.
- Castellino, A., Parker, G.J., Boronenkov, I.V., Anderson, R.A. and Chao, M.V. (1997) A novel interaction between the juxtamembrane region of the p55 TNF receptor and phosphatidylinositol-4-phosphate 5-kinase. *J Biol Chem* 272, 5861-5874.

- Hempstead, B.L. and Chao, M.V. (1997) Entering the domain of neurotrophin binding. *Nature Biotech* 15, 506-507.
- Wong, B.R., Rho, J., Arron, J., Robinson, E., Orlinick, J., Chao, M., Kalachikov, S., Cayani, E., Bartlett, F.S., Frankel, W.N., Lee, S.Y. and Choi, Y. (1997) TRANCE is a novel ligand of the tumor necrosis factor receptor family that activates c-Jun N-terminal kinase in T cells. *J Biol Chem* 272, 25190-25194.
- Casaccia-Bonnet, P., Tikoo, R., Kiyokawa, H., Friedrich, V., Chao, M.V. and Koff, A. (1997) Oligodendrocyte precursor differentiation is perturbed in the absence of the cyclin-dependent kinase inhibitor p27^{Kip1}. *Genes and Development* 11, 2335-2346.
- Orlinick, J.R., Vaishnav, A., Elkon, K. and Chao, M.V. (1997) Requirement of cysteine-rich repeats of the Fas receptor for binding by the Fas ligand. *J Biol Chem* 272, 28889-28894.
- Yoon, S.O., Soltoff, S.P. and Chao, M.V. (1997) A dominant role of the juxtamembrane region of the trkA NGF receptor during neuronal cell differentiation. *J Biol Chem* 272, 23231-23238.
- Orlinick, J.R., Elkon, K. and Chao, M.V. (1997) Separate domains of the human Fas ligand dictate self association and receptor binding. *J Biol Chem* 272, 32221-32229.
- Casaccia-Bonnet, P., Kong, H. and Chao, M.V. (1998) Neurotrophins: the biological paradox of survival factors eliciting apoptosis. *Cell Death and Differentiation* 5, 357-364.
- Yoon, S.O., Casaccia-Bonnet, P., Carter, B. and Chao, M.V. (1998) Competitive signaling between TrkA and p75 nerve growth factor receptors determines cell survival. *J Neuroscience* 18, 3273-3281.
- Tikoo, R., Osterhout, D., Casaccia-Bonnet, P., Seth, P., Koff, A. and Chao, M.V. (1998) Ectopic expression of p27^{Kip} in oligodendrocyte progenitor cells results in cell cycle growth arrest. *J Neurobiology* 36, 431-440.
- Orlinick, J.R. and Chao, M.V. (1998) TNF-related ligands and their receptors. *Cell Signaling* 10, 543-551.
- Gu, C., Castellino, A., Chan, J-H. and Chao, M.V. (1998) BRE: a modulator of TNF- α action. *FASEB J* 12, 1101-1108.
- Chao, M., Casaccia-Bonnet, P., Carter, B., Chittka, A., Kong, H. and Yoon, S.O. (1998) Neurotrophin receptors: mediators of life and death. *Brain Res Rev* 26, 295-301.
- Aibel, L., Martin-Zanca, D., Perez, P. and Chao, M.V. (1998) Functional expression of TrkA receptors in hippocampal neurons. *J Neurosci Res* 54, 424-431.
- Khursigara, G., Orlinick, J.R. and Chao, M.V. (1999) Association of TRAF6 with the p75 neurotrophin receptor. *J Biol Chem* 274, 2597-2600.
- Vaishnav, A.K., Orlinick, J.R., Chu, J.L., Krammer, P.H., Chao, M.V. and Elkon, K.B. (1999) The molecular basis for apoptotic defects in patients with CD95 (Fas/Apo-1) mutations. *J Clinical Invest* 103, 355-363.
- Castellino, A.M. and Chao, M.V. (1999) Differential association of phosphatidylinositol-5-phosphate 4 kinase with the EGF/ErbB family of receptors. *Cell Signaling* 11, 171-177.
- Gu, C., Casaccia-Bonnet, P., Srinivasan, A. and Chao, M.V. (1999) Oligodendrocyte apoptosis mediated

by caspase activation. *J Neuroscience* 19, 3043-3049.

Osterhout, D.J., Wolven, A., Wolf, R.M., Resh, M.D. and Chao, M.V. (1999) Morphological differentiation of oligodendrocytes requires activation of Fyn tyrosine kinase. *J Cell Biol* 145, 1209-1218.

Casaccia-Bonnet, P., Gu, C., Khursigara, G. and Chao, M.V. (1999) p75 neurotrophin receptor as a modulator of survival and death decisions. *Microscopy Res and Tech* 45, 217-224.

Casaccia-Bonnet, P., Hardy, R.J., Teng, K.K., Levine, J.M., Koff, A. and Chao, M.V. (1999) Loss of p27Kip1 function results in increased proliferative capacity of oligodendrocyte progenitors but unaltered timing of differentiation. *Development* 126, 4027-4037

Chittka, A. and Chao, M.V. (1999) Identification of a novel zinc finger protein whose subcellular distribution is regulated by serum and nerve growth factor. *Proc Natl Acad Sci USA* 96, 10705-10710.

Kong, H., Kim, A.H., Orlinick, J.R. and Chao, M.V. (1999) A comparison of the death domains of the Fas receptor and the p75 neurotrophin receptor. *Cell Death and Differentiation* 6, 1134-1143.

Dowling, P., Ming, X., Raval, S., Husar, W., Casaccia-Bonnet, P., Chao, M., Cook, S. and Blumberg, B. (1999) Up-regulated p75NTR neurotrophin receptor on glial cells in MS plaques. *Neurology* 53, 1676.

Yano, H., Cong, F., Birge, R.B., Goff, S.P. and Chao, M.V. (2000) Association of the Abl tyrosine kinase with the Trk nerve growth factor receptor. *J. Neurosci. Res.* 59, 356-364.

Chao, M.V. (2000) Trophic factors: An evolutionary cul-de-sac or door into higher neuronal function? *J. Neurosci. Res.* 59, 353-355

Arevalo, J.C., Conde, B., Hempstead, B.L., Chao, M.V., Martin-Zanca, D. and Perez, P. (2000) TrkA immunoglobulin-like binding domains inhibit spontaneous activation of the receptor. *Mol. Cell. Biol.* 20, 5908-5916.

Gu, C., Ma, Y-C., Benjamin, J., Littman, D., Chao, M.V. and Huang, X-Y. (2000) Apoptotic signaling through the β -adrenergic receptor. *J. Biol. Chem.* 275, 20726-20733.

Tikoo, R., Zanazzi, G., Shiffman, D., Salzer, J. and Chao, M.V. (2000) Cell cycle control of Schwann cell proliferation: Role of cyclin-dependent kinase-2. *J. Neuroscience* 20, 4627-4634.

Yano, H. and Chao, M.V. (2000) Neurotrophin receptor structure and interactions. *Pharm Acta Helv* 74, 253-260.

Zezula, J., Casaccia-Bonnet, P., Ezhevsky, S.A., Osterhout, D.J., Levine, J.M., Dowdy, S.F., Chao, M.V. and Koff, A. (2001) p21cip1 is required for the differentiation of oligodendrocytes independently of cell cycle withdrawal. *EMBO Reports* 21, 27-34.

Kong, H., Boutler, J., Weber, J.L., Lai, C. and Chao, M.V. (2001) An evolutionarily conserved transmembrane protein that serves as a downstream target for neurotrophins and ephrin receptors. *J. Neuroscience* 21, 170-185.

Kim, A., Khursigara, G., Sun, X., Franke, T. and Chao, M.V. (2001) Akt phosphorylates and negatively regulates apoptosis signal regulating kinase 1. *Mol Cell Biol* 21, 893-901.

- Yano, H., Lee, F., Kong, H., Chuang, J.-Zen, Arevalo, J.C., Perez, P., Sung, C.H. and Chao, M.V. (2001) Association of Trk neurotrophin receptors with components of the cytoplasmic dynein motor. *J. Neuroscience* 21, RC125.
- Lou, X, Yano, H., Lee, F.S., Chao, M.V. and Farquhar, M (2001) GIPC and GAIP form a complex with TrkA: a putative link between G-protein and receptor tyrosine kinase pathways. *Mol Biol Cell* 12, 615-627.
- Arevalo, J.C., Conde, B., Hempstead, B.L., Chao, M.V., Martin-Zanca, D. and Perez, P. (2001) A novel mutation within the extracellular domain of TrkA causes constitutive receptor activation. *Oncogene* 20, 1229-1234.
- Khursigara, G., Bertin, J., Yano, H., Moffett, H., Stefano, P.S. and Chao, M.V. (2001) A pro-survival function for the p75 receptor death domain mediated via the caspase recruitment domain receptor interacting protein 2. *J. Neuroscience* 21, 5854-5863.
- Lee, F.S. and Chao, M.V. (2001) Activation of Trk neurotrophin receptors in the absence of neurotrophins. *Proc. Natl. Acad. Sci. USA* 98, 3555-3560.
- Lee, C.J., Kong, H., Manzini, M.C., Albuquerque, C., Chao, M.V. and MacDermott, A.B. (2001) Kainate receptors expressed by a subpopulation of developing nociceptors rapidly switch from high to low Ca²⁺ permeability. *J Neuroscience* 21, 4572-4581.
- Lee, F.S., Kim, A.H., Khursigara, G. and Chao, M.V. (2001) The uniqueness of being a neurotrophin receptor. *Current Opinion in Neurobiology* 11, 281-286.
- Caporaso, G.L. and Chao, M.V. (2001) Telomerase and oligodendrocyte differentiation. *J. Neurobiology* 49, 224-234.
- Chuang, H., Prescott, E.D., Kong, H., Shields, S., Jordt, S.E., Basbaum, A.I., Chao, M.V. and Julius, D. (2001) Bradykinin and nerve growth factor release the capsaicin receptor from PIP₂-mediated inhibition. *Nature* 411, 957-962.
- Wolf, R.M., Wilkes, J.J., Chao, M.V. and Resh, M.D. (2001) Tyrosine phosphorylation of p190 RhoGAP by Fyn regulates oligodendrocyte differentiation. *J. Neurobiology* 49, 62-78.
- Esposito, D., Patel, P., Stephens, R.M., Perez, P., Chao, M.V., Kaplan, D.R. and Hempstead, B.L. (2001) The cytoplasmic and transmembrane domains of the p75 and TrkA receptors regulate high affinity binding to NGF. *J. Biol. Chem.* 276, 32687-32695.
- Legrier, M.E., Ducray, A., Propper, A., Chao, M. and Kastner, A. (2001) Cell cycle regulation during mouse olfactory neurogenesis. *Cell Growth Differentiation* 12, 591-601.
- Okuse, K., Malik-Hall, M., Baker, M.D., Poon, W.Y., Kong, H., Chao, M.V. and Wood, J.N. (2002) Annexin II light chain regulates sensory neuron-specific sodium channel expression. *Nature* 417, 653-656.
- Chao, M.V. and Bothwell, M. (2002) Neurotrophins: To cleave or not to cleave. *Neuron* 33, 9-12.
- Lee, F.S., Rajagopal, R. and Chao, M.V. (2002) Distinctive features of Trk neurotrophin transactivation by G protein-coupled receptors. *Cytokine Growth Factor Rev* 13, 11-17.
- Lee, F.S., Rajagopal, R., Kim, A.H., Chang, P.C. and Chao, M.V. (2002) Activation of Trk neurotrophin receptor signaling by pituitary adenylate cyclase-activating polypeptides. *J. Biol. Chem.* 277, 9096-

- Doetsch, F., Verdugo, J M-G., Caille, I., Alvarez-Buylla, A., Chao, M.V. and Casaccia-Bonnet, P. (2002) Lack of the cell cycle inhibitor p27^{Kip1} results in selective increase of transit-amplifying cells for adult neurogenesis. *J. Neuroscience* 22, 2255-2264.
- Harroch, S., Furtado, G.C., Beueck, W., Rosenbluth, J., Lafaille, J., Chao, M., Buxbaum, J.D. and Schlessinger, J. (2002) A critical role for the protein tyrosine phosphatase receptor type beta in functional recovery from demyelinating lesions. *Nature Genetics* 32, 411-414.
- Kim, A.H., Yano, H., Cho, H., Meyer, D., Monks, B., Margolis, B., Birnbaum, M.J. and Chao, M.V. (2002) Akt1 regulates a JNK scaffold during excitotoxic apoptosis. *Neuron* 35, 697-709.
- Chao, M.V. (2003) Neurotrophins and their receptors: A convergence point for many signaling pathways. *Nature Rev Neuroscience* 4, 299-309.
- Kim, A.H., Sasaki, T and Chao, M.V. (2003) JNK interacting protein 1 promotes Akt1 activation. *J Biol Chem* 279, 29830-29836.
- Chao, M.V. (2003). Retrograde transport redux. *Neuron* 39, 1-2.
- Shonukan, O., Bagayogo, I., McCrea, P., Chao, M. and Hempstead, B. (2003) Neurotrophin-induced melanoma cell migration is mediated through the actin-bundling protein fascin. *Oncogene* 22, 3616-3623.
- Caporaso, G., Lim, D.A., Alvarez-Buylla, A. and Chao, M.V. (2003). Telomerase activity in the subventricular zone of adult mice. *Mol Cell Neuroscience*. 4, 693-702.
- Jung, K.M., Tan, S., Landsman, N., Petrova, K., Murray, S., Lewis, R., Kim, P.K., Kim, D.S., Ryu, S.H., Chao, M.V. and Kim, T.W. (2003) Regulated intramembraneous proteolysis of the p75 receptor modulates its association with the TrkA receptor. *J Biol Chem* 278, 42161-42169.
- Chao, M.V. (2003) Dependence receptors: what is the mechanism? *Science STKE*, PE38.
- Yano, H. and Chao, M.V. (2004) Mechanisms of neurotrophin receptor vesicular transport. *J.Neurobiology* 58, 244-257.
- Kim, D.H, Zhao, X., Tu, CH, Casaccia-Bonnet, P and Chao, M.V. (2004) Prevention of apoptotic but not necrotic cell death following neuronal injury by neurotrophin signaling through the tyrosine kinase receptor. *J Neurosurgery* 100, 79-87.
- Schiavo, G. and Chao, M.V. (2004) Motors, adaptors, and receptors: Key elements of neuronal transport. *J Neurobiology* 58, 161-163.
- Chittka, S., Arevalo, J.C., Rodriguez-Guzman, M., Perez, P., Chao, M.V. and Sendtner, M. (2004) The p75^{NTR} interacting protein SC1 inhibits cell cycle progression by transcriptional repression of cyclin E, *J Cell Biology* 164, 985-996.
- Murray, S., Perez, P., Lee, R., Hempstead, B.L. and Chao, M.V. (2004) A novel p75 neurotrophin receptor related protein, NRH2, regulates NGF binding to the TrkA receptor. *J Neuroscience* 24, 2742-2749.

- Akassoglou, K., Malester, B., Xu, J., Tessarollo, L., Rosenbluth, J. and Chao, M.V. (2004) Brain-specific deletion of Neuropathy Target Esterase/*swisscheese* results in neurodegeneration. *Proc Natl Acad Sci USA* 101, 5075-5080.
- Arevalo, J.C., Yano, H., Teng, K.K., Chao, M.V. (2004) A unique pathway for sustained neurotrophin signaling through an ankyrin-rich membrane spanning protein. *EMBO J* 23, 2358-2368.
- Murray, S., Perez, P., Lee, R., Hempstead, B.L. and Chao, M.V. (2004) A novel p75 neurotrophin receptor related protein, NRH2, regulates NGF binding to the TrkA receptor. *J Neuroscience* 24, 2742-2749.
- Zampieri, N. and Chao, M.V. (2004) The p75 NGF receptor exposed. *Science* 304, 833-834.
- Rajagopal, R., Chen, Z.-Y., Lee, F.S. and Chao, M.V. (2004) Transactivation of Trk neurotrophin receptors by G-protein-coupled receptor ligands occurs on intracellular membranes. *J. Neuroscience* 24, 6650-6658.
- Chang, M.S., Arevalo, J.C. and Chao, M.V. (2004) Ternary complex with Trk, p75 and an ankyrin-rich membrane spanning protein. *J Neurosci Res* 78, 186-192.
- Chao, M.V. and Lee, F.S. (2004) Neurotrophin survival signaling mechanisms. *J Alzheimers Disease*, S7-S11.
- Domeniconi, M., Zampieri, N., Spencer, T., Hilaire, M., Mellado, W., Chao, M.V., Filbin, M.T. (2005) MAG induces regulated intramembrane proteolysis of the p75 neurotrophin receptor to inhibit neurite outgrowth. *Neuron* 46, 849-855.
- Arevalo, J.C. and Chao, M.V. (2005) When neurotrophins meet Wnts. *Current Opinion Cell Biol* 7, 112-115.
- Luo, S., Chen, Y., Lai, K.O., Arevalo, J.C., Froehner, S.C., Adams, M.E., Chao, M.V. and Ip, N.Y. (2005) alpha-syntrophin regulates ARMS localization at the neuromuscular junction and enhances EphA4 signaling in an ARMS-dependent manner. *J Cell Biol* 169, 813-824.
- Taveggia, C., Zanazzi, G., Petrylak, A., Yano, H., Rosenbluth, J., Einheber, S., Xu, X., Esper, R.M., Loeb, J.A., Shrager, P., Chao, M.V., Falls, D.L., Role, L. and Salzer, J.L. (2005) Neuregulin-1 Type III determines the ensheathment fate of axons. *Neuron* 47, 681-694.
- Zampieri, N., Xu, C., Neubert, T.A., Chao, M.V. (2005) Cleavage of p75 neurotrophin receptor by alpha secretase and gamma-secretase requires specific receptor domains. *J Biol Chem* 280, 14563-14571.
- Chao, M.V., Rajagopal, R. and Lee, F.S. (2005) Neurotrophin signaling in health and disease. *Clinical Science* 110, 167-173.
- Arevalo, J.C., Pereira, D., Yano, H., Teng, K.K. and Chao, M.V. (2006) Identification of a switch in neurotrophin signaling by selective tyrosine phosphorylation, *J. Biol Chem* 281, 1001-1007.
- Kenchappa, R.S., Zampieri, N., Chao, M.V., Barker, P.A., Teng, H.K., Hempstead, B.L. and Carter, B.D. (2006) Ligand-dependent cleavage of the p75 neurotrophin receptor is necessary for NRIF nuclear translocation and apoptosis in sympathetic neurons. *Neuron* 50, 219-232.
- Arevalo, J.C., Waite, J., Rajagopal, R., Beyna, M., Chen, Z.-Y., Lee, F.S. and Chao, M.V. (2006) Cell

- survival through Trk neurotrophin receptors is differentially regulated by ubiquitination. *Neuron* 50, 549-559.
- Rajagopal, R. and Chao, M.V. (2006) A role for Fyn in Trk receptor transactivation by G-protein-coupled receptor signaling. *Mol. Cell. Neurosci* 33, 36-46.
- Yano, H., Ninan, I., Zhang, H., Milner, T.A., Arancio, O., Chao, M.V. (2006) BDNF-mediated neurotransmission relies upon a myosin VI motor complex. *Nature Neurosci* 9, 1009-1018.
- Jeanneteau, F. and Chao, M.V. (2006) Promoting neurotrophic effects by GPCR ligands. *Novartis Found. Symp.* 276, 181-189.
- Zampieri, N. and Chao, M.V. (2006) Mechanisms of neurotrophin receptor signaling. *Biochem. Soc. Trans.* 34, 607-611.
- Urrea, S., Escudero, C.A., Ramos, P., Lisbona, F., Allende E., Covarrubias, P., Parraguez, J.I., Zampieri, N., Chao, M.V., Annaert, W. and Bronfman, F.C. (2007) TrkA receptor activation by nerve growth factor induces shedding of the p75 neurotrophin receptor followed by endosomal gamma-ssecretase-mediated release of the p75 intracellular domain. *J. Biol. Chem.* 282, 7606-7615.
- Domeniconi, M., Hempstead, B.L. and Chao, M.V. (2007) Pro-NGF secreted by astrocytes promotes motor neuron cell death. *Mol. Cell. Neuroscience* 34, 271-279.
- Rantamaki, T., Hendolin, P., Kankaanpaa, A., Mijatovic, J., Piepponen, P., Domenici, E., Chao, M.V., Mannisto, P.T. and Castren, E. (2007) Pharmacologically diverse antidepressants rapidly activate BDNF receptor TrkB and induce phospholipase-Cgamma signaling pathways in mouse brain. *Neuropsychopharm* 32, 2152-2152.
- Arancio, O. and Chao, M.V. (2007) Neurotrophins, synaptic plasticity, and dementia. *Current Opinion in Neurobiol.* 17, 325-330.
- Cortes, R.Y., Arevalo, J.C., Magby, J.P., Chao, M.V. and Plummer, M.R. (2007) Developmental and activity-dependent regulation of ARMS/Kidins220 in cultured rat hippocampal neurons. *Dev. Neurobiol* 67, 1687-1698.
- Sachs, B.D., Baillie, G.S., McCall, J.R., Pasino, M.A., Schachtrup, C., Wallace, D.A., Dunlop, A.J., MacKenzie, K.F., Klussmann, E., Lynch, M.J., Sikorski, S.L., Nuriel, T., Tsigelny, I., Zhang, J., Houslay, M.D., Chao, M.V. and Akassoglou, K. (2007). p75 neurotrophin receptor regulates tissue fibrosis through inhibition of plasminogen activation via a PDE4/cAMP/PKA pathway. *J. Cell Biol.* 177, 1119-1132.
- Pereira, D.B. and Chao, M.V. (2007) The tyrosine kinase Fyn determines the localization of TrkB receptors in lipid rafts. *J Neuroscience* 27, 4859-4869.
- Wiese, S., Jablonka, S., Holtmann, B., Orel, N., Rajagopal, R., Chao, M.V. and Sendtner, M. (2007) Adenosine receptor A_{2A}-R contributes to motoneuron survival by transactivating the tyrosine kinase receptor TrkB. *Proc. Natl. Acad. Sci.* 104, 17210-17215.
- Bath, K.G., Mandairon, N., Jing, D., Rajagopal, R., Kapoor, R., Chen, Z-Y., Khan, T., Proenca, C.C., Kraemer, R., Cleland, T.A., Hempstead, B.L., Chao, M.V. and Lee, F.S. (2008) Variant Brain-derived Neurotrophic Factor (Val66Met) alters adult olfactory bulb neurogenesis and spontaneous olfactory discrimination. *J. Neuroscience* 28, 2383-2393.

Sniderhan, L.F., Stout, A., Lu, Y., Chao, M.V. and Maggiwar, S.B. (2008) Ankyrin-rich membrane spanning protein plays a critical role in nuclear factor-kappaB signaling. *Mol. Cell. Neurosci.*, ahead of print.

Iwakawa, Y., Nawa, H., Sora, I. and Chao, M.V. (2008) Dopamine D1 receptor-induced signaling through TrkB receptors in striatal neurons. *J. Biol. Chem* 283, 15799-15806.

Jeanneteau, F., Garabedian, M. and Chao, M.V. (2008) Activation of Trk neurotrophin receptors by glucocorticoids provides a neuroprotective effect. *Proc. Natl. Acad. Sci.* 105, 4862-4867.